Construction of Physical Fitness and Functional Fitness test norms for fireman works in Maharashtra.

SYNOPSIS

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By

Mr. Girish Kailas Paygude

Research Supervisor

Dr. Minanath Shivajirao Gomchale

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Swami Ramanand Teerth Marathwada University, Nanded.

(Maharahtra)

Construction of Centralize Physical Fitness and Functional Fitness Tests norms for fireman working in Maharashtra.

1. INTRODUCTION

It is widely recognized that the role of a firefighter involves a wide variety of tasks that can be both physically and mentally arduous, and often unpredictable in nature and duration. As such, an integral part of being able to perform the role of a firefighter safely and effectively is the maintenance of physical health and fitness. It is important that there is a test battery to saw the fitness of firefighter's at the time of recruitment. But after the joining on job I assume they don't as care of there health as they did before recruitment.

However, it is also important to understand the health behavior of current personnel and identify associated risks to health and wellbeing. The fitness of firemen, those brave men who work in extremely strenuous and risky profession where adequate, Highly developed, fitness and general condition may decide on life or death. Also they need of their Functional fitness in the serious situations.

2. STATEMENT OF THE PROBLEM

The effect of modernisation, rapid urbanisation thinning of geographical boundaries within a countries across nations has created problem related to the safety and security of both human as well as other resources of the country.

Manmade and natural disasters are happening with increased frequency and velocity. In the view of this there is tremendous pressure on military and para military forces. The efficiency of

people involved in prevention, rescue operation is depends upon their physical and functional fitness. The fire brigade of the city has multiple roles to play, although the name fire brigade/firemen include only fire, there role is just not restricted to firefighting. It encompasses all activity include in disaster management. For all these events fire Brigade have an entrance test but that all nominal tests means there is no proper norms for that tests.

Therefore it is of interest of researcher to investigate and create norms for entrance physical fitness test and functional fitness test of firemen in Maharashtra. The statement of problem can best be stated as "**Construction of Physical Fitness and Functional Fitness Tests norms for fireman works in Maharashtra".**

3. SIGNIFICANCE OF THE STUDY

- Result of the study may give the proper norms for entrance of fire brigade department and it will helpful for choosing right candidates for right place.

- This study will help fire brigade department of different districts to know about their fireman's physical fitness and functional fitness. And in there helpful for the physical trainer and training Institutes to develop the training program for them.

4. REVIEW OF RELATED LITERATURE

1. **Physical Fitness of Professional Firemen**

This study did by Albrecht L. Claessens, Leen Van Langendonck, Dries Moons and Filip Wandewiele in 2003. They studied 1) screening the physical fitness of professional fire-brigade, 2) Testing the influence of training program on physical fitness of professional firemen. They took EUROFIT test battery on 95 professional firemen and in 4 months subject perform exercise twice in a week.

High values for body mass index (27.1+_3.3kg/m3) and percentage of body fat (26.0+-4.9%) and a low score for endurance capacity were observed. Co-relation analysis demonstrate that motor capacity decreases with aging. Analyzing the differences (test session2 – test session1) indicates that there were no significant changes in physical fitness over the four month training period. Comparing the two groups with the different number of training session attended not reveal any significance difference between two groups.

It can be concluded that:

1. The fireman of the fire brigade under study were rather old, had high BMI and a high percentage of body fat.
2. The performance at the endurance shuttle run did not reach the anticipated standard.
3. The training program did not gain the desired results.

2. **Predicting Performance on a Firefighting Specific Ability Test in Volunteer Firefighters**

This study did by Z. Kerns, D. Bennett, G. Moir in The use of firefighter specific Ability Tests (AT) could allow firefighters to monitor their own fitness, and expose areas that need improvement. Those improvements could help decrease chances of fatality or injury and improve performance in firefighting operations leading to more lives saved. **Purpose**: The purpose of this investigation was to study the relationship between fitness parameters and performance on a firefighting specific ability test. **Subjects**: Nine certified firefighters (27.11±10.56 yr, 89.74±21.92 kg, mean±SD) from the East Stroudsburg Volunteer Fire Department performed the AT. **Methods:** The AT consisted of 6 events performed consecutively: stair climb, hose drag, equipment carry, ladder raise & extension, search, and rescue. Prior to the AT all subjects performed the following fitness parameter tests: aerobic capacity (VO_{2max}), push-ups in a minute, sit-ups in a minute, handgrip strength (Dynamometer), and lower body power (Vertical Jump). Pearson's product moment correlations and linear regression statistics used to determine the strength of relationship between variables and to predict AT performance from the fitness variables. **Results:** VO_{2max} (r=-.812) and sit-ups in a minute (r=-.787) were found to be significantly inversely correlated with overall AT time. VO_{2max} could predict AT performance from the following regression equation (R^2=0.61): AT time = 0.148*(VO_{2max})+11.915. The equation for the fitted model with R^2=0.61 is: AT Time = -0.148 * (VO_2 max) + 11.915. **Conclusion:** The results suggest VO_{2max} to be an important physiological variable for firefighter's performance, explaining 61% of variance in AT performance. Future research should explore other relevant fitness parameters such as, Critical Power, Lactate Threshold and Maximal Strength, in combination for prediction of performance on AT; which may help to explain the remaining variance in performance, as well as to identify the specific training factors crucial to firefighter performance.

5. OPERATIONAL DEFINITION

- **Physical Fitness:-** It is the ability of a person to overcome a daily tasks and have ample of energy for emergency. **Physical fitness** is a general state of health and well-being or specifically the ability to perform aspects of sports or occupations.
- **Functional Fitness**:- This will be define as the fitness which is essential for those activities identified by an individual as essential to support physical, social and psychological well-being and to create a personal sense of meaningful living

6. OBJECTIVE OF STUDY

- To examine the physical fitness of Firefighters.
- To examine the functional fitness amongst Firefighters.
- To examine the association between physical fitness and Functional fitness of firemen.
- To create the norms for the entrance test of fire brigade.

7. HYPOTHESIS

H1

There will be significantly positive correlation between Physical fitness and Functional fitness in Firefighters of Pune city.

H0

There will no significant correlation between Physical fitness and Functional fitness in Firefighters of Pune city.

8. ASSUMTION

It is assumed that Firemen will more actively & willingly participate in all test.

9. SCOPE

The study will be conducted on those candidates who completed and appearing fire fighting course of.

10. LIMITATIONS

- Firefighter will not have any mental and physical problem.

11. DELIMITATION

- This study is delimited to firefighters of Pune city. (N=500)
- This study is delimited to Physical fitness and Functional fitness in Fire fighter.

12. METHODOLOGY

This research is descriptive correlational research. Researcher will measure Physical fitness and Functional fitness in Firemen of Pune city. Research will correlate between Physical fitness and Functional fitness in Firefighters of Pune Region.

13. SAMPLING

A) Population: Firefighters of Maharashtra. N=500

B) SAMPLE: purposive method of sampling will be used. Purposively 500 Firemen of Pune city.

14. TOOLS FOR DATA COLLECTION

- The data will be collected through Conducting test.

15. PROCEDURE OF STUDY

1. Sit and Reach :-

equipment required: sit and reach box (or alternatively a ruler can be used, and a step or box).

procedure: This test involves sitting on the floor with legs stretched out straight ahead. Shoes should be removed. The soles of the feet are placed flat against the box. Both knees should be locked and pressed flat to the floor - the tester may assist by holding them down. With the palms facing downwards, and the hands on top of each other or side by side, the subject reaches forward along the measuring line as far as possible. Ensure that the hands remain at the same level, not one reaching further forward than the other. After some practice reaches, the subject reaches out and holds that position for at one-two seconds while the distance is recorded. Make sure there are no jerky movements. See also video demonstrations of the Sit and Reach Test.

scoring: The score is recorded to the nearest centimeter or half inch as the distance reached by the hand. Some test versions use the level of the feet as the zero mark, while others have the zero mark 9 inches before the feet. There is also the modified sit and reach test which adjusts the zero mark depending on the arm and leg length of the subject. There are some norms for the sit and reach test and also examples of some actual athlete results.

2. 10*4 Shuttle run

purpose: this is a test of speed and agility

equipment required: stopwatch, measuring tape, marker cones, a flat non-slip surface

procedure: marker cones and/or lines are placed five meters apart. Start with a foot at one marker. When instructed by the timer, the subject runs to the opposite marker, turns and returns to the starting line. This is repeated five times without stopping (covering 40 meters total). At each marker both feet must fully cross the line.

scoring: Record the total time taken to complete the 40 m course

3. Standing Broad Jump

purpose: to measure the explosive power of the legs

equipment required: tape measure to measure distance jumped, non-slip floor for takeoff, and soft landing area preferred. Commercial Long Jump Landing Mats are also available. The take off line should be clearly marked.

procedure: The athlete stands behind a line marked on the ground with feet slightly apart. A two foot take-off and landing is used, with swinging of the arms and bending of the knees to provide forward drive. The subject attempts to jump as far as possible, landing on both feet without falling backwards. Three attempts are allowed. See some long jump video examples.

scoring: The measurement is taken from take-off line to the nearest point of contact on the landing (back of the heels). Record the longest distance jumped, the best of three attempts. The table below gives a rating scale for the standing long jump test for adults, based on personal experiences.

4. Body Mass Index

Body Mass Index (BMI) is a simple means of placing people into the categories of underweight, normal, overweight, and obese. It has become popular largely because the government and health profession have vigorously promoted it and it requires simple measurements (height and weight) that are generally made during routine physical exams.

5. 1min Push up Test

The push-up fitness test (also called the press up test) measures upper body strength and endurance. There are many variations of the push up test, such as different placement of the hands, how far to dip, the duration of the test and the method of counting the number of completed push ups.

possible equipment required: depending on which protocol you use, you will need a floor mat, metronome (or audio tape, clapping, drums), stopwatch, wall, chair.

procedure: A standard push up begins with the hands and toes touching the floor, the body and legs in a straight line, feet slightly apart, the arms at shoulder width apart, extended and at a right angles to the body. Keeping the back and knees straight, the subject lowers the body to a predetermined point, to touch some other object, or until there is a 90-degree angle at the elbows, then returns back to the starting position with the arms extended. This action is repeated, and test continues until exhaustion, or until they can do no more in rhythm or have reached the target number of push-ups. See push up videos for some examples of push up fitness tests.

scoring: Record the number of correctly completed push-ups.

Functional Fitness:-

1. **Equipment Carry**

Equipment

This event uses two saws and a tool cabinet replicating a storage cabinet on a fire truck.

Purpose of evaluation

The equipment carry event is designed to simulate the critical tasks of removing power tools from a fire apparatus, carrying them to the emergency scene and returning the equipment to the fire apparatus.

Event

During the equipment carry event, you remove two saws from the tool cabinet, one at a time, and place them on the ground. Next, you pick up both saws, one in each hand, and carry them while walking 75 feet (22.86 metres) around the drum, then back to the starting point. You are permitted to place the saw(s) on the ground and adjust the grip. Upon return to the tool cabinet, you place the saws on the ground, and then picking up each saw one at a time, replace the saw in the designated space in the cabinet.

This concludes the event; you then walk 85 feet (25.91 metres) within the established walkway to the next event.

2. **Ladder Raise and Extension**

Equipment

This event uses two 24 foot (7.32 metre) fire department ladders. For your safety, a retractable lanyard is attached to the ladder that you raise.

Purpose of evaluation

The ladder raise and extension event is designed to simulate the critical tasks of placing a ground ladder at a fire structure and extending the ladder to the roof or window.

Event

During the ladder raise and extension event, you walk to the top rung of the 24 foot (7.32 metre) aluminum extension ladder, lift the unhinged end from the ground, and walk it up until it is stationary against the wall. This must be done in a hand over hand fashion, using each rung until the ladder is stationary against the wall. You must not use the ladder rails to raise the ladder.

Next you immediately proceed to the pre-positioned and secured 24 foot (7.32 metre) aluminum extension ladder, stand with both feet within the marked box of 36 inches by 36 inches (91.44 centimetres x 91.44 centimetres) and extend the fly section hand over hand until it hits the stop. You then lower the fly section hand over hand in a controlled fashion to the starting position.

This concludes the event; you then walk 85 feet (25.91 metres) within the established walkway to the next event.

3. Rope Climbing

Equipment

This event use 25feet rope.

Purpose of evaluation

The search event is designed to simulate the critical task of climbing the ropewhich measures the strength endurance of the vectum

Event

During the rope climbing Event you hold the rope in hand and that is approximate 25feet (91.44cm) high and three inches thick. You have to climb up 20feet and come down as fast as possible. If for any reason, you choose to end the event call out and you will be assisted out. The timing will be counted in second.

4. Rescue

Equipment

This event uses a weighted mannequin equipped with a harness with shoulder handles.

Purpose of evaluation

The rescue event is designed to simulate the critical task of removing a victim or injured partner from a fire scene.

Event

During the rescue event, you grasp the 165 pound (74.84 kilogram) mannequin by the handle(s) on the shoulder(s) of the harness (either one or both handles are permitted), drag it 35 feet (10.67 metres) to a pre-positioned drum, make a one hundred and eighty degree turn around the drum, and continue an additional 35 feet (10.67 metres) to the finish line.

You are not permitted to grasp or rest on the drum. It is permissible for the mannequin to touch the drum. You are permitted to drop and release the mannequin and adjust the grip. The entire mannequin must be dragged past the marked finish line.

This concludes the event you then walk 85 feet (25.91 metres) within the established walkway to the next event.

5. Hose Run

Equipment

90feet Hose, Water Supply.

Procedure

150feet of 1 ¾ inch line will be collected to the water supply source. Candidate will be require to pull the charge hose line for 90feet the candidate will complete this station when both feet cross the marked line. This station assess your legs strength and overall cardio vascular endurance. You can prepare for this event by dragging a weighed object across the ground using rope for a distance of 90feet.You may want to be win with lesser weights and build up to a total weight similar to that use in the hose drag station.

16. Statistical analyses

Experimental will be used to assess the score of Physical fitness and Functional fitness while Spearman method will be used to correlate Physical fitness and Functional fitness.

17. References:-

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